Listing of Claims:

1. A method of an opto-chemical multiband sensing or a molecular identification comprising steps of: providing a composition capable of characteristic multiband spectral absorption or multiband spectral emission when the composition is excited by a surface plasmon resonance source, the composition comprising a fluorophore, a nanoparticle and a spacer, wherein the spacer separates the fluorophore from the nanoparticle; placing the composition into a sample containing an analyte to allow for a chemical interaction of the composition with the analyte; irradiating the sample by the source; and monitoring the multiband spectral absorption or multiband spectral emission of the composition for each chemical interaction of the composition with the analyte.
2. The method of claim 1, wherein the fluorophore is an organic molecule, an inorganic molecule, a biomolecule or a microbe.
3. Cancelled
4. The method of claim 1, wherein the analyte is selected from the group consisting of glucose, inorganic molecule, organic molecule, protein, amino acid, oligonucleotide, lipid, sugar moiety, purine or pyrimidine, nucleoside or nucleotide.
5. The method of claim 1, wherein the spacer is selected from the group consisting of: a biorecognitive spacer, a dielectric spacer, a chemical link spacer, an analyte sensitive spacer or a polymer spacer.
6. The method of claim 1, wherein the nanoparticle is a metal, conductor, super-conductor, semiconductor or dielectric.

7. The method of claim 6, wherein the metal is selected from the group consisting of silver, ruthenium, platinum, rhenium, rhodium, osmium, iridium, copper, palladium and gold.
8. The method of claim 1, wherein the nanoparticle is sub-wavelength less in size.
9. The method of claim 1, wherein the spacer separates the fluorophore from the nanoparticle by a distance longer than 10 nm.
10. Cancelled
11. Cancelled
12. Cancelled
13. The method of claim 1, wherein the sample is a bio-chip, a flow cell, an endoscope, a microscopic slide, a total internal reflection cell, a catheter, an optical fiber, a waveguide, a body, food, soil, water or air
14. The method of claim 1, wherein the source is selected from the group consisting of: a laser with single wavelength, laser with plurality wavelengths, laser diode, light emitted diode, lamp, bioluminescence, chemiluminescence, or electroluminescence.
15. The method of claim 1, wherein the method further comprises analyses of a low excited state or higher excited states of absorption bands or fluorescence bands of the fluorophore.
16. Cancelled
17. The method of claim 1, wherein the monitoring of the multiband absorption or the multiband emission of the fluorophore is performed by at least one of the selected techniques: absorption, fluorescence, time-resolved, polarization, energy transfer, hyperspectral imaging, Raman scattering, microscopy or microscopy imaging.

18.–19. Cancelled

20. The method of claim 1, wherein the spacer further modifies the multiband spectral property of the fluorophore.